

In the claims:

Claims 8, 15 and 27 are cancelled.

Claims 7, 9, 14, 16, 26 and 28 of claims 1-7, 9-14, 16-26 and 29-31 are amended.

New claims 32-41 are added.

1 1. (Original) A data storage apparatus comprising:
2 a read head for reading magnetic data from a recorded portion of a recording layer of a
3 perpendicularly recorded magnetic medium;

4 a stabilizer for magnetically stabilizing a portion of an underlayer of the magnetic medium
5 directly below the recorded portion simultaneously while the read head is reading said magnetic
6 data from the recorded portion; and

7 the read head and the stabilizer being separate structures.

1 2. (Original) A data storage apparatus as claimed in claim 1 wherein the stabilizer
2 includes:

3 first and second elongated probes and a bridge with the bridge interconnecting the first and
4 second probes; and

5 the read head being located between the first and second probes.

1 3. (Original) A data storage apparatus as claimed in claim 1 further comprising:
2 the read head having a head surface which defines a head surface plane;
3 the first probe being closer to the read head than the second probe; and
4 the first probe being recessed from the head surface plane and the second probe being
5 coextensive with the head surface plane.

1 4. (Original) A data storage apparatus as claimed in claim 3 wherein the first probe
2 increases in magnetic material volume as it extends toward the head surface.

1 5. (Original) A data storage apparatus as claimed in claim 1 further comprising:
2 biasing means for applying a constant bias field to the stabilizer.

1 6. (Original) A data storage apparatus as claimed in claim 5 wherein the constant
2 bias field is greater than two (2) times the magnetic coercivity of the soft underlayer.

1 7. (Currently Amended) A data storage apparatus as claimed in claim [[1]] 2 further
2 comprising:
3 a write head which has first and second pole pieces; and
4 one of the first and second probes and one of the first and second pole pieces being a
5 common component.

8. (Cancelled)

1 9. (Currently Amended) A data storage apparatus as claimed in claim [[8]] 7
2 further comprising:
3 the read head having a head surface which defines a head surface plane;
4 the first probe being closer to the read head than the second probe; and
5 the first probe being recessed from the head surface plane and the second probe being
6 coextensive with the head surface plane.

1 10. (Original) A data storage apparatus as claimed in claim 9 wherein the first probe
2 increases in magnetic material volume as it extends toward the head surface.

1 11. (Original) A data storage apparatus as claimed in claim 10 further comprising:
2 biasing means for applying a constant bias field to the stabilizer.

1 12. (Original) A data storage apparatus as claimed in claim 11 wherein the constant
2 bias field is greater than two (2) times the magnetic coercivity of the soft underlayer.

1 13. (Original) A data storage apparatus as claimed in claim 12 wherein the read
2 head comprises:
3 nonmagnetic first and second read gap layers;
4 a sensor located between the first and second read gap layers;
5 ferromagnetic first and second shield layers; and
6 the first and second read gap layers being located between the first and second shield layers.

1 14. (Currently Amended) A data storage apparatus as claimed in claim [[1]] 2
2 further comprising:
3 a write head; and
4 in addition to the read head being located between the first and second probes, the write
5 head also being located between the first and second probes.

15. (Cancelled)

1 16. (Currently Amended) A data storage apparatus as claimed in claim [[15]] 14
2 further comprising:
3 the read head having a head surface which defines a head surface plane;
4 the first probe being closer to the read head than the second probe; and
5 the first probe being recessed from the head surface plane and the second probe being
6 coextensive with the head surface plane.

1 17. (Original) A data storage apparatus as claimed in claim 16 wherein the first
2 probe increases in magnetic material volume as it extends toward the head surface.

1 18. (Original) A data storage apparatus as claimed in claim 17 further comprising:
2 biasing means for applying a constant bias field to the stabilizer.

1 19. (Original) A data storage apparatus as claimed in claim 18 wherein the constant
2 bias field is greater than two (2) times the magnetic coercivity of the soft underlayer.

1 20. (Original) A data storage apparatus as claimed in claim 19 wherein the read
2 head comprises:
3 nonmagnetic first and second read gap layers;
4 a sensor located between the first and second read gap layers;
5 ferromagnetic first and second shield layers; and
6 the first and second read gap layers being located between the first and second shield layers.

1 21. (Original) A method of making a data storage apparatus comprising the steps of:
2 forming a read head for reading magnetic data from a recorded portion of a recording layer
3 of a perpendicularly recorded magnetic medium;

4 forming a stabilizer for magnetically stabilizing a portion of an underlayer of the magnetic
5 medium directly below the recorded portion simultaneously while the read head is reading said
6 magnetic data from the recorded portion; and

7 forming the read head and the stabilizer as separate structures.

1 22. (Original) A method as claimed in claim 21 wherein the method further
2 comprises the steps of:

3 providing the stabilizer with first and second elongated probes and a bridge wherein the
4 bridge interconnects the first and second probes; and

5 locating the read head between the first and second probes.

1 23. (Original) A method as claimed in claim 22 wherein the method further
2 comprises the steps of:

3 providing the read head having a head surface which defines a head surface plane;

4 locating the first probe closer to the read head than the second probe; and

5 recessing the first probe from the head surface plane and making the second probe
6 coextensive with the head surface plane.

1 24. (Original) A method as claimed in claim 23 wherein the method further
2 comprises the step of:

3 applying a constant bias field to the stabilizer.

1 25. (Original) A method as claimed in claim 24 wherein the constant bias field is
2 formed greater than two (2) times the magnetic coercivity of the soft underlayer.

1 26. (Currently Amended) A method as claimed in claim [[21]] 22 wherein the
2 method further comprises the steps of:

3 providing a write head; and

4 in addition to locating the read head between the first and second probes, also locating the
5 write head between the first and second probes.

1 27. (Cancelled)

2 28. (Currently Amended) A method as claimed in claim [[27]] 26 wherein the
method further comprises the steps of:

3 providing the read head having a head surface which defines a head surface plane;
4 locating the first probe closer to the read head than the second probe; and
5 recessing the first probe from the head surface plane and making the second probe
6 coextensive with the head surface plane.

1 29. (Original) A method as claimed in claim 28 wherein the method further
comprises the step of:

3 applying a constant bias field to the stabilizer.

1 30. (Original) A method as claimed in claim 29 wherein the constant bias field is
formed greater than two (2) times the magnetic coercivity of the soft underlayer.

1 31. (Original) A method of suppressing noise while reading from a perpendicular
recorded medium comprising the steps of:

3 employing a read head for reading a recorded portion of a top recording layer; and
4 simultaneously with said reading, employing a stabilizer, which is separate from the read
5 head, for introducing a field into a portion of a bottom underlayer directly below the recorded
6 portion with sufficient strength to stabilize said portion of the bottom underlayer in a single domain
7 state.

1 32. (New) A data storage apparatus comprising:
2 a read head for reading magnetic data from a recorded portion of a recording layer of a
3 perpendicularly recorded magnetic medium;

4 the read head including a read sensor and first and second shield layers with the read sensor
5 being located between the first and second shield layers;

6 a stabilizer for magnetically stabilizing a portion of an underlayer of the magnetic medium
7 directly below the recorded portion simultaneously while the read head is reading said magnetic
8 data from the recorded portion; and

9 the read sensor and the stabilizer being separate structures and magnetically decoupled with
10 respect to one another.

1 33. (New) A data storage apparatus as claimed in claim 32 wherein the stabilizer
2 includes:

3 first and second elongated spaced apart probes and a bridge with the bridge interconnecting
4 the first and second probes;

5 means for energizing the bridge so that magnetic flux flows between the space between the
6 probes; and

7 the read head being located between the first and second probes.

1 34. (New) A data storage apparatus as claimed in claim 32 further comprising:
2 the read head having a head surface which defines a head surface plane; and
3 the first probe being recessed from the head surface plane and the second probe being
4 coextensive with the head surface plane.

1 35. (New) A data storage apparatus as claimed in claim 34 wherein the first probe
2 increases in magnetic material volume as it extends toward the head surface.

1 36. (New) A data storage apparatus as claimed in claim 32 further comprising:
2 biasing means for applying a constant bias field to the stabilizer.

1 37. (New) A data storage apparatus as claimed in claim 36 wherein the constant
2 bias field is greater than two (2) times the magnetic coercivity of the soft underlayer.

1 38. (New) A data storage apparatus as claimed in claim 33 further comprising:
2 a write head which has first and second pole pieces; and
3 one of the first and second probes and one of the first and second pole pieces being a
4 common component.

1 39. (New) A data storage apparatus as claimed in claim 33 further comprising:
2 a write head; and
3 in addition to the read head being located between the first and second probes, the write
4 head also being located between the first and second probes.

1 40. (New) A data storage apparatus as claimed in claim 39 further comprising:
2 the read head having a head surface which defines a head surface plane; and
3 the first probe being recessed from the head surface plane and the second probe being
4 coextensive with the head surface plane.

1 41. (New) A data storage apparatus as claimed in claim 40 wherein the first probe
2 increases in magnetic material volume as it extends toward the head surface.